

ASPECTS REGARDING THE ORGANISATION OF PRODUCTION PROCESSES IN THE CONTEXT CONTINUOUS IMPROVEMENT

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Abstract: In a highly competitive environment withstands the companies that are able to meet the requirements. The client's requirements are products or services adapted their needs regarding both the performances and the compliance with delivery terms and payment conditions. It is justified the interest of companies for improvement. In the general framework of continuous improvement is integrated JIT method, through specific approach and coordination of production processes. In the paper are presented the method features and the implementation's particularities of this method in industrial organizations.

1. GENERAL FRAMEWORK

“Change, improvement, innovation” are three categories which nowadays reflect the concerns of organisations for which the main concern is quality. Simple defined, quality means the fulfilment of requirements. Quality represents the degree in which a number of intrinsic characteristics fulfil the requirements [6]. The attribute of quality associated to a product or a service implies several aspects:

- The fulfilment of customers' requirements by means of offering products or services adapted to diverse and dynamic needs regarding both the performances and the compliance with delivery terms and payment conditions.
- The fulfilment of the requirements imposed by society by means of offering products or services which relate more or less to the natural environment: the manufacturing and operation of products that affect less the environment, the health and security of people.

The condition for the surviving of companies in a highly competitive environment is the orientation towards change, in such a degree that they are able to meet the requirements. The change may affect both the products and the manufacturing technology. It can also include the company's entire activity: methods for the promotion and distribution of products, methods for the management of production, leading structures and methods, etc. No matter what it refers to or the proportion of change, it is not an easy thing to achieve. It takes time and it asks for planning and involvement.

According to specialists' opinions [4, 5], when referring to their complexity, changes fall into two categories:

- a) Innovation processes;
- b) Improvement processes.

There are differences between these two categories of processes as their fulfilment requires different management systems. Improvement processes imply low proportion changes, the actions taking place from “bottom to top” with the risk assumed by the organisation being small. The result of the improvement activities is represented by the obtaining of a superior quality level of products and services.

The fundamental principle of modern management – continuous improvement – is defined in literature [3, 4, 5] as the repeated activity leading to an increase in the ability of meeting requirements. The strategy of continuous improvement, also known under the

Japanese name of KAIZEN, was successfully adopted and applied within Japanese companies, as a result of their concern for increasing performances at company level. For the Japanese, the continuous improvement appears as an alternative to performance improvement by means of innovation. KAIZEN implies gradual improvement, with small steps, taking operative measures against the problems encountered in the developing of processes. KAIZEN does not leave out innovation. Innovation comes as a result of day to day efforts towards the accomplishment of a continuous process regarding the application of small improvements and not as a full sized improvement that can be accomplished through important investments in new technologies and/or new equipments.

According to the Japanese specialist Masaaki Imai, the founder of the concept, KAIZEN can be compared to a huge “umbrella” under which there are typically Japanese techniques, management practices, methods and concepts, verified and applied in time in the Japanese companies. Among the methods, the techniques and the concepts specific to Japanese companies, the following have known a large applicability: Total Quality Control – TQM, Just In Time (JIT), Total Productive Maintenance (TPM), KANBAN, JIDOKA, SMED, POKA-YOKE, the system of suggestions, the quality circles, the Taguchi Method etc.

In the general framework of continuous improvement – a premise to achieve a superior quality level of products - is integrated JIT method, through specific approach and coordination of production processes.

2. THE „JUST IN TIME” METHOD

In literature [1, 2], this method is considered to be one of the instruments that are necessary in the superior organisation of production. The application of this method goes back in the past in the early 1960's, when Taiichi Ohno signalled it at Toyota. At the beginning of the 1980's, the concept and later on its methodology for application, were adopted in the USA in different companies, either identically or under different other names, such as: ZIPS (Zero Inventory Production System), MAN (Material as needed) etc.

The “JUST IN TIME “ method represents a method for the coordination of the production processes that involve activities by means of which the manufacturing of parts or components is assured, exactly when they are needed. Not sooner, not later but just in time. The right time for the production of these components is established by means of orders that come from the following working place. The fundamental principle on which JIT is based is the “pull” strategy in the production of those components necessary for manufacturing. In this way the manufacturing orders address the last working position of the technological process (this normally being the assembly line) which in its turn hands over the necessary number of components, the components of the previous working position and so on and so forth.

This characteristic makes JIT differ from the classic way of organising the manufacturing process, based on the “push” strategy, the necessary components into production. Characteristic for the classical way of organising production is the existence of interoperational and finite products stocks supplies which, by the time they are delivered, represent important immobilized capital.

Starting from the premise that any production system must own only those stocks necessary for the obtaining of the products contracted by the beneficiaries, the JIT method has as a main objective the minimisation of raw materials stocks as well as of interoperational stocks, going as far as bringing these down to the zero level.

3. LEVELS OF METHOD IMPLEMENTING

The implementation of this method in industrial practice involves change approach from two perspectives:

- a) It requires the reorganisation of manufacture programming and of the manufacturing itself.
- b) It requires the synchronization of suppliers and the manufacturing processes of the company organised according to the principles of the method.

The necessary changes, as far as the manufacture programming is concerned, refers to the fact that this is done taking into account the quantities and the time limits the customers desires. Fig. 1 shows the synthetic process of the JIT method application at the production units' level.

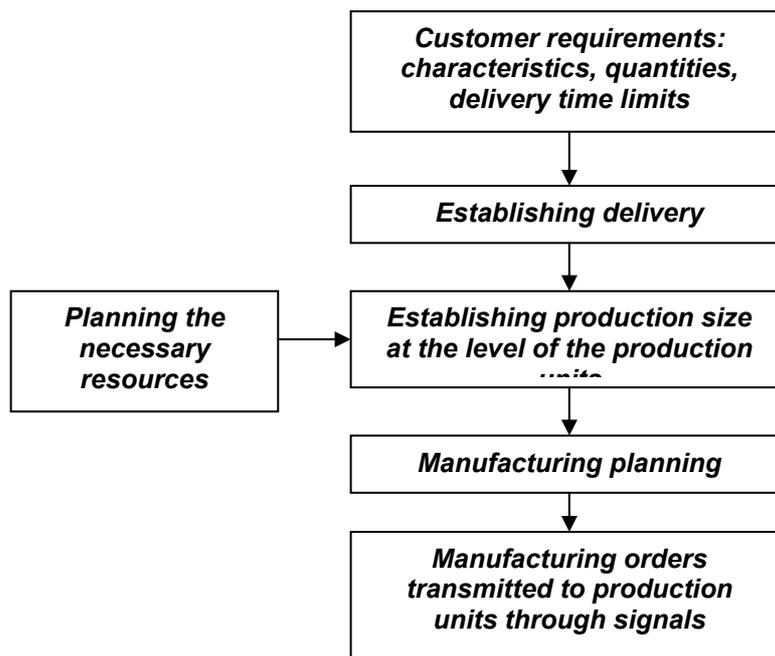


Fig. 1 The process of JIT application

The manufacture orders are transmitted to productive subsystems by means of KANBAN (which in Japanese means “signal” but which is used within the production systems under the name of “label” or card”). The KANBAN system uses two types of specific cards: one of them transmits the manufacture order from the last work place to upstream work place. The other card authorises the movement of the fabrication lot from upstream to downstream. The KANBAN card commands the movement of the lot into outflow and adjusts the size of the stock from the supplier to the beneficiary, being attached to a standard container into which that particular lot is transported. The containers used in the case of manufacture organised according to JIT principles must be small, reusable, and especially done for each type or quantity specified by the parts.

The accurate size of containers allows the exact specification of content, the precise and easy numbering of components, the diminishing of losses and the reduction of packaging costs.

In other words, KANBAN is a tool that allows a better control of unfinished production and a quick intervention upon stocks evolution by easy visualisation of the situation previous to stock breach.

The KANBAN system can be considered a method of manufacture and production overall ordering as it implies:

- Parts manufacture and transport in small quantities;
- The downstream working positions will not produce more than the ones from upstream require.

In this way the system assures manufacture flexibility, a manufacture process at the right time and in the strictly necessary quantity, the reduction of raw material stocks, finite products and interoperational stocks.

JIT implementation requires changes as far as manufacturing itself in concerned. These refer to:

- The placement of production units in such a way that similar operation are brought together in order to reduce the waiting time;
- The specialisation of production units for families/classes of components or products;
- The use of group technologies;
- The assurance of qualitative control according to the concept of total quality control.

The second perspective from which the JIT method implementation can be regarded is that of the synchronization of suppliers' processes with the processes of the organisation. This objective derives from the objective of the method itself that of prompt response to requests. Subsequently, suppliers must be able to deliver frequently and differently the ordered quantities of raw materials, materials, components, after the assembly unit has started the realisation of the product. Another condition imposed to suppliers is that of delivering quality products.

In this context the rigorous selection and evaluation of suppliers is absolutely necessary. Previous to contracting, in order to initially evaluate the capability of the supplier and its quality, methods for diagnosis can be used. The two methods: the self-evaluation questionnaire and the pre-evaluation audit can be used either separately, or in combination, followed by pre-audit after which the decision is made whether the supplier corresponds to the requirements or not.

4. CONCLUSION

The organisation of manufacture processes according to JIT principles and the step towards JIT manufacturing generates a number of benefits for the company, such as:

- The reduction of the manufacture period;
- The reduction of manufacturing costs which will be reflected in the selling price of the manufactured products;
- The reduction of costs with rejects and reconditioning;
- The maintaining of a minimum level of stocks;
- The simplifying of manufacture planning and programming;
- The continuous improvement of product quality by increasing the speed of response to customers' orders and on time response to orders together with the fulfilment of specifications;
- Overall improvement of efficiency within the company.

The "JUST IN TIME" organisation of manufacturing does not mean only changes at the operational level. It implies more than the implementation of some rules to be followed, typical procedures to be explained and understood in the process of human resources training. The successful implementation of the method implies the overcome of people's resistance to change, a difficult mission for top management.

The method will be efficient as long as the employees, regardless their hierarchical level, are aware and willing to accept the changes occurred in the working procedures usually used, as well as they realise the existence of increased responsibilities of their own

work and become active participants at the working place, by means of their ideas, bringing their own contribution to the continuous improvement of processes.

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